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The 2008 financial crisis: Changes in social capital and its association with psychological wellbeing in the United Kingdom – A panel study

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ABSTRACT

The global financial crisis of 2008 was described by the IMF as the worst recession since the Great Depression. This historic event provided the backdrop to this United Kingdom (UK) longitudinal study of changes in associations between social capital and psychological wellbeing. Past longitudinal studies have reported that the presence of social capital may buffer against adverse mental health outcomes. This study adds to existing literature by employing data from the British Household Panel Survey and tracking the *same* individuals (N = 11,743) pre- and immediately post-crisis (years 2007–09). With longitudinal, multilevel logistic regression modelling, we aimed to compare the buffering effects of individual-level social capital (generalised trust and social participation) against worse psychological wellbeing (GHQ-12) during and immediately after the 2008 financial crisis. After comparing the *same individuals* over time, results showed that stocks of social capital (generalised trust) were significantly depleted across the UK during the crisis, from 40% trusting others in 2007 to 32% in 2008. Despite this drop, the buffering effect of trust against worse psychological wellbeing was pronounced in 2008; those not trusting had an increased risk of worse psychological wellbeing in 2008 compared with the previous year in fully adjusted models (OR = 1.49, 95% CI (1.34–1.65). Levels of active participation increased across the timeframe of this study but were not associated with psychological health. From our empirical evidence, decision makers should be made aware of how events such as the crisis (and the measures taken to counter its effects) could negatively impact on a Nation's trust levels. Furthermore, past research implies that the positive effects of trust on psychological wellbeing evident in this study may only be short-term; therefore, decision makers should also prioritise policies that restore trust levels to improve the psychological wellbeing of the population.

1. Introduction

Key adverse economic events in the United States (US), namely an unexpected rise in interest rates, the bursting of the 2005-06 housing bubble and subsequent large-scale defaulting on mortgage payments were all precursors to the US sub-prime mortgage crisis of 2007 (British Broadcasting Corporation, 2007). Negative fiscal repercussions extended well into 2008 and by March, after three major financial institutions failed to repay loans, the US Government injected US$236 billion into the American banking system (Mathiason, 2008). Over the following months, worsening economic conditions spread internationally and developed into the 2008 global financial crisis, an event described by Alan Greenspan as a "once-in-a-century credit tsunami" (Greenspan, 2008) and by the IMF as "… the worst recession since the Great Depression."(Beale, 2009).

The 2008 crisis provided the backdrop for this United Kingdom (UK) study of social capital and psychological wellbeing. The first real effects of this event were felt in the UK on Monday 15th September 2008, when Lehman Brothers declared bankruptcy and closed their doors to business in London (British Broadcasting Corporation, 2008). By 11th October 2008, approximately £90 billion were lost on the London Stock Exchange. In response to the global financial contagion, the Bank of England announced in late

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October 2008 that it would lower its base-rate of interest and the UK Government promised to prop up failing financial institutions with tax-payers money (Kingsley, 2012).

For the purposes of this study, the 2008 financial crisis was considered a natural experiment of sorts, i.e. an historical (period) event, simultaneously experienced across the UK. As theorised by Pildes (1996), a negative event such as this had the potential to deplete stocks of social capital, a resource loosely defined as 'social networks, norms of reciprocation and trust' (Putnam, 2004).

Interestingly, previous empirical evidence from British Household Panel Survey data (BHPS) provides some support for this theory, with Giordano et al. (2012) revealing that 45% of individuals reported changes in generalised trust levels over a seven-year period (2000–07). Other national panel datasets to include trust measurements show similar short-term fluctuations (for examples see: Glanville et al., 2013; van Ingen and Bekkers, 2015). Such findings contradict the belief that generalised trust is determined in early life and is resistant to change, irrespective of later-life experiences (Putnam, 2000; Uslaner, 2002). Instead, such fluctuations reflect the economic viewpoint that trust is a summary measure of individual experiences, good and bad (Glaeser et al., 2000).

Social capital is considered a resource, which has been theorised both at the contextual- (Berkman and Kawachi, 2000; Putnam, 2000) and individual-level (Bourdieu, 1986; Coleman, 1988; Portes, 1998). Attempting to resolve such conceptual differences empirically, multilevel research suggests that the effects of social capital on health appear strongest at the individual-level, with typically only 0–4% of all variation in individual health being attributed to community-level aggregates (e.g. Giordano et al., 2011; Islam et al., 2006; Murayama et al., 2012; Poortinga, 2006; Subramanian et al., 2002; Suzuki et al., 2010; Waverijn et al., 2014).

To date, there is a large body of empirical evidence suggesting that the presence of social capital is positively associated with a variety of individual general health (Islam et al., 2006; Murayama et al., 2012) and mental health outcomes (Bassett and Moore, 2013; Cao et al., 2015; Fujiwara and Kawachi, 2008; Giordano and Lindström, 2011; see also: Ehsan and De Silva, 2015; McPherson et al., 2014; Whitley and McKenzie, 2005 for reviews). From these, the proxy 'generalised trust' provided the most consistent (positive) associations with health outcomes (Kim et al., 2008). However, there remains strong critique surrounding the research field of social capital and health (Muntaner, 2004; Pearce and Davey Smith, 2003), which is further compounded by the lack of a universally accepted social capital definition, or consistent measurements to quantify its effects on health (Macinko and Starfield, 2001).

Despite this critique, several mechanisms have been postulated as to how social capital could influence health by: i) deterring socially 'deviant' behaviours (e.g. excess alcohol consumption, smoking and crime); ii) increasing the dissemination of positive health messages and health behaviour 'norms'; iii) increasing access to resources, i.e. greater availability and use of prevention services, and; iv) providing a buffer against psychosocial stress (Kawachi et al., 1999). Several of these mechanisms seem relevant to the outcome of this study (psychological wellbeing); for example, high crime levels, associated lower levels of generalised trust and increased psychosocial stresses are well known precursors to worse psychological wellbeing (Aneshensel and Sucoff, 1996). Chronic stress can lead to raised levels of blood cortisol via the hypothalamic-pituitary-adrenal axis (Shively et al., 2009), which in turn, have been linked to several deleterious health outcomes, such as type II diabetes, cardio-vascular disease and poor mental health (Hemingway and Marmot, 1999; Watson and Mackin, 2006). Furthermore, active social participation, considered by Putnam as the cornerstone of social capital generation (2000), could have positive effects on psychological wellbeing through increased social ties and community integration (Kawachi and Berkman, 2001).

In relation to the buffering effects of social capital against worsening mental health, to date only a handful of longitudinal empirical research papers have been identified. A recent on-line search within PUBMED, Web of Science, SCOPUS and Google Scholar revealed just nine articles to investigate social capital and mental health outcomes over time (Bertotti et al., 2013; Ding et al., 2015; Frank et al., 2014; Giordano and Lindström, 2011; Hall et al., 2014; Han, 2015; Murayama et al., 2013; Tsuboya et al., 2015; Verduin et al., 2014). All demonstrated positive associations between social capital and better individual mental health outcomes. Of these, just one had tested the hypothesis that social capital buffered against economic stress and worsening mental health (Frank et al., 2014). In their paper, Frank et al. (2014) concluded that the presence of social capital in rural Canada moderated the effects that financial strain had on perceived stress and depressive symptoms ($N_T = 317$). Conversely, in their cross-sectional study of the effects of post-crisis austerity on mental health outcomes in Greece, Economou et al. (2014) concluded that the buffering effects of social capital were fully attenuated if individuals were under high economic stress ($N_T = 2256$). From the above, there are a limited number of longitudinal empirical social capital and mental health studies and, regarding the buffering effects of social capital against mental health outcomes when considering financial strain, results are not in agreement.

To address this, and to investigate events surrounding the 2008 crisis in the UK, we prepared panel data to compare the *same* individuals ($N_T = 11{,}743$) pre- and post-crisis (2007–09). In this fashion, there was opportunity to investigate: i) if the advent of the crisis coincided with depletion in social capital, and ii) if the presence of individual-level social capital protected against worse psychological wellbeing during the 2008 financial crisis. The aim of this study, therefore, was to investigate if stocks of social capital in 2008 continued to buffer against worse psychological wellbeing during times of potential financial turmoil. We hypothesise that social capital stocks were depleted during the crisis and for those individuals who retained high levels of social capital (trust and participation), its presence would buffer against worsening psychological wellbeing. To our knowledge, this is the first longitudinal research paper to investigate the buffering effects of social capital on psychological wellbeing in the UK, against the backdrop of this historic event.

2. Methods

2.1. Data collection

The British Household Panel Survey (BHPS) is a longitudinal survey of randomly selected private households, which has been conducted annually by the UK's Economic and Social Research Centre since 1991. The first cohort sample was randomly selected by using a two-stage cluster design, and a total of 8166 private postal addresses around the UK were originally selected. Individuals aged 16 years or older were invited to participate, with a total of 10,264 individual face-to-face interviews being completed in the first BHPS wave (participation rate 95%). Since then, individuals from this nationally representative sample of selected households have been interviewed annually with a view to identifying social and economic changes within the British population. Data derived from *individual-level* responses from Waves 17 (2007) and 18 (2008) were used for this study, with a total of 13,826 individuals consenting to participate in 2007 and 13,710 in 2008. All data were weighted after collection by the Research Centre to

adjust for non-response in the standard fashion (Elliot, 1991); further weighting was not recommended (Taylor et al., 2010, p.184).

For each Wave, face-to-face interviews took place between September and May, with the date, month and year for all respondents being recorded (i.e. all interviews for Wave 1 were conducted between 1st Sept 1991–30th April 1992). In all eighteen Waves of the BHPS, approximately half of all anticipated interviews for that year were completed by the end of October. Full details of the selection process, weighting and participation rates can be found on-line (Taylor et al., 2010).

The raw data for this panel study come from the BHPS *individual-level* responses in Wave 17 (Sept 2007–April 2008) and Wave 18 (Sept 2008–April 2009). Unique cross-wave identifiers meant that individuals, who responded to all considered variables in this study, could be followed ($N = 11{,}743$). Full interview participation rates for year 2008 (as compared to year 2007) were 95.0%, with 44.5% being from the original 1991 cohort sample.

The Research Centre fully adopted the Ethical Guidelines of the Social Research Association; informed consent was obtained from all participants and strict confidentiality protocols were adhered to throughout data collection, processing procedures and subsequent analyses for this study by the authors.

2.2. Dependent variable

The dichotomous outcome in this study was psychological wellbeing, obtained using the 12-item General Health Questionnaire (GHQ-12) (Golderberg and Williams, 1988). Depending on the answers obtained, if three or more of the twelve items deemed to reflect poor psychological wellbeing were selected, then respondents were categorised as having 'worse' psychological wellbeing (1); all others were labelled 'better' psychological wellbeing (0) (Golderberg and Williams, 1988) - see appendix for more detail. The GHQ-12 item has been shown to have an overall sensitivity of 83.4% and a specificity of 76.3% when compared with the GHQ-28 item in a study of psychological disorders in general health care, suggesting that the GHQ-12 tool is comparable to other more complex assessment instruments (Goldberg et al., 1997).

2.3. Independent variables

2.3.1. Social capital proxies

Generalised trust was assessed by asking people: 'Would you say that most people can be trusted, or that you can't be too careful?' Possible answers were 'Most people can be trusted', 'You can't be too careful' and 'It depends'. This variable was dichotomised, with only those respondents stating that most people could be trusted being labelled 'Can trust' (0); all negative responses (including 'it depends') were labelled 'Can't trust' (1) (Uslaner, 2002).

Social participation was measured by asking respondents questions about being active members of voluntary community groups or any sports, hobby or leisure group activity found locally. Only those who answered positively to any of these were judged to participate (0), with all others being labelled 'No participation' (1). Note that the question was posed slightly differently in 2008 compared to 2007 - see appendix for more detail.

2.3.2. Marital status

Respondents were asked if they were 'married, separated, divorced, widowed or never married'. Marital status was recoded into 'married' (0) and 'unmarried' (1) (separated, divorced, widowed, never married) (Afifi et al., 2006).

2.3.3. Socio-economic variables

Annual household income was weighted according to size by summing the total income of all household members (net of taxation) and dividing this sum by the square root of the household size (Burkhauser et al., 1996). The log of this income measure was kept as a continuous variable (per £1000 increase) for all analyses. Social class was determined by respondents' most recent occupation, derived from the Registrar General's Social Classification of occupations. The usual six categories (see appendix) were maintained for all analyses (reference (0) being Class I), with those yet to be employed labelled 'never worked'. To compliment this, a further current employment status variable was categorized as 'Employed' (0), 'Retired' (1), 'Fulltime student' (2) or 'Unemployed' (3).

Highest achieved education was categorised as 'Undergraduate or higher' (0), 'Year 13' (1), 'Year 11' (2) or 'No formal qualifications' (3). Finally, perceived financial stress was assessed by asking respondents about their current financial situation compared to the previous year. Possible responses were 'About the same' (0), 'Now better off' (1) or 'Now worse off' (2). These three categories were maintained.

2.3.4. Confounders

Self-rated health (SRH) was assessed by the question: 'Compared to people your own age, would you say that your health has on the whole been: excellent, good, fair, poor or very poor?' As standard, this five-point scale was recoded into the dichotomous variable 'good' (0) (excellent, good) and 'poor' (1) (fair, poor, very poor) health (Manor et al., 2000).

Age and gender (men (0), women (1)) were also considered confounders in this study, with age being stratified into quintiles for descriptive purposes (see Table 1) and employed as a continuous variable (per 10 year increase) in all analyses.

Values for *all* variables were obtained from the *same* individuals ($N = 11{,}743$) in years 2007 and 2008 (BHPS Waves 17 and 18). The two data panels were subsequently merged to form a single multilevel, longitudinal dataset (occasions (time - level 1) clustered on individuals (level 2)).

2.3.5. Statistical analysis

Analysis 1 tested if changes in social capital between 2007 and 2008 (Table 1b) were statistically significant. To this effect, we performed logistic regression pairwise tests using the multilevel, longitudinal dataset previously described, for full year-on-year comparison ($N = 11{,}743$). Trust (can trust – (0); cannot trust – (1)) was the dichotomous outcome, with time (2007 – (0) and 2008 (1)) as the sole covariate. Odds ratios derived here described the same individuals' risk of not trusting in 2008 compared to 2007, alongside a 95% confidence interval (See Table 1c (i)).

In analysis 2, we further investigated associations between changes in social capital over time as the financial crisis unfolded, with all data from Analysis 1 now being stratified by date and month (Table 1c (ii)). As dictated by data collection and events described in the introduction, timeframe cut-offs in 2008–09 were: 1st – 14th Sept; 15th – 30th Sept; 1st – 31st Oct; 1st – 30th Nov; and 1st Dec – 30th April. Identical tests were repeated with social participation as the outcome (participates (0); no participation (1)) against time (Table 1c).

Analysis 3 investigated associations between worse psychological wellbeing in 2008 and *all* considered covariates (including time) in a multilevel, longitudinal logistic regression model (time clustered on individuals). The model allowed a random intercept for each individual and we obtained standard errors that were adjusted for the temporal correlation of GHQ-12 scores *within* the same individual across the timeframe of this study, whilst allowing a between-Wave comparison. The outcome of interest was 'worse

Table 1a
Baseline (yr 2007) frequencies of all considered variables expressed as integers and percentages in italics (%) of N_T (11,743) stratified by psychological wellbeing (GHQ-12).

		Psychological wellbeing		
		Better	Worse	Total (N_T)
Age (years)[a]	16–34	2555	861	3416
		21.8%	*7.3%*	*29.1%*
	35–44	1723	594	2317
		14.7%	*5.1%*	*19.7%*
	45–54	1472	512	1984
		12.5%	*4.4%*	*16.9%*
	55–64	1376	408	1784
		11.7%	*3.5%*	*15.2%*
	65+	1712	529	2241
		14.6%	*4.5%*	*19.1%*
Total		8838	2904	11,742
		75.3%	*24.7%*	*100.0%*
Gender	Male	4219	1055	5274
		35.9%	*9.0%*	*44.6%*
	Female	4620	1849	6469
		39.3%	*15.7%*	*55.1%*
Total		8839	2904	11,743
		75.3%	*24.7%*	*100.0%*
Generalised trust	Trusts others	3732	959	4691
		31.8%	*8.2%*	*39.9%*
	Cannot trust	5107	1945	7052
		43.5%	*16.6%*	*60.1%*
Total		8839	2904	11,743
		75.3%	*24.7%*	*100.0%*
Active participation[b]	Participates	3936	1189	5125
		33.5%	*10.1%*	*43.7%*
	No participation	4901	1715	6616
		41.7%	*14.6%*	*56.3%*
Total		8837	2904	11,741
		75.3%	*24.7%*	*100.0%*
Self - rated health[a]	Good health	6877	1448	8325
		58.6%	*12.3%*	*70.9%*
	Poor health	1962	1455	3417
		16.7%	*12.4%*	*29.1%*
Total		8839	2903	11,742
		75.3%	*24.7%*	*100.0%*
Marital status[a]	Married	4956	1422	6378
		42.2%	*12.1%*	*54.3%*
	Not married	3882	1482	5364
		33.1%	*12.6%*	*45.7%*
Total		8838	2904	11,742
		75.3%	*24.7%*	*100.0%*
Social class: based on most recent (RGSC) occupation	I	385	113	498
		3.3%	*1.0%*	*4.2%*
	II	2633	813	2446
		22.4%	*6.9%*	*29.3%*
	IIIa	1970	731	2701
		16.8%	*6.2%*	*23.0%*
	IIIb	1508	405	1913
		12.8%	*3.4%*	*16.3%*
	IV	1413	466	1879
		12.0%	*4.0%*	*16.0%*
	V	432	171	603
		3.7%	*1.5%*	*5.1%*
	Never worked	498	205	703
		4.2%	*1.7%*	*6.0%*
Total		8839	2904	11,743
		75.3%	*24.7%*	*100.0%*
Education achieved[c]	Undergraduate or higher	1976	625	2601
		17.0%	*5.4%*	*22.4%*
	Year 13	1774	601	2375
		15.3%	*5.2%*	*20.5%*
	Year 11	2766	850	3616
		23.8%	*7.3%*	*31.2%*
	No formal qualifications	2219	790	3009
		19.1%	*6.8%*	*25.9%*
Total		8735	2866	11,601
		75.3%	*24.7%*	*100.0%*

Table 1a (*continued*)

		Psychological wellbeing		
		Better	Worse	Total (N_T)
Employment status	Employed	5412	1482	6894
		46.1%	*12.6%*	*58.7%*
	Full-time student	518	177	695
		4.4%	*1.5%*	*5.9%*
	Retired	1916	597	2513
		16.3%	*5.1%*	*21.4%*
	Unemployed	993	648	1641
		8.5%	*5.5%*	*14.0%*
Total		8839	2904	11,743
		75.3%	*24.7%*	*100.0%*
Current financial situation	Still the same	4280	1165	5445
		36.4%	*9.9%*	*46.4%*
situation compared with last year	Worse off	2905	1196	4101
		24.7%	*10.2%*	*34.9%*
	Better off	1654	543	2197
		14.1%	*4.6%*	*18.7%*
Total		8839	2904	11,743
		75.3%	*24.7%*	*100.0%*
Household income, (annual) - size weighted	< £6552	2179	748	2927
		18.6%	*6.4%*	*24.9%*
	£6553–£12,623	2113	811	2924
		18.0%	*6.9%*	*24.9%*
	£12,624–£21,343	2218	725	2943
		18.9%	*6.2%*	*25.1%*
	£21,344 +	2329	620	2949
		19.8%	*5.3%*	*25.1%*
Total		8839	2904	11,743
		75.3%	*24.7%*	*100.0%*

Missing [a]N = 1.
Missing [b]N = 2.
Missing [c]N = 142.
Source: BHPS Wave 17, 2007.

Table 1b
Frequencies of social capital levels (as measured by generalised trust and social participation) from the same respondents in years 2007 and 2008, expressed as integers and percentages in italics (%) N = 11,743.

Social capital		BHPS Waves	
		Wave 17 (2007)	Wave 18 (2008)
Generalised trust	Trusts others	4691	3775
		40.0%	*32.1%*
	Cannot trust	7052	7968
		60.0%	*67.9%*
	Total	11,743	11,743
		100.0%	*100.0%*
Social participation	Active participation	5125	6149
		43.6%	52.4%
	No participation	6616	5594
		56.4%	47.6%
	Total	11,741[a]	11,743
		100.0%	*100.0%*

Missing [a] = 2
Source: BHPS, Waves 17 & 18.

psychological wellbeing' in 2008 (1) whilst considering the same individuals' GHQ-12 score in 2007; odd ratios derived from Analysis 3 (the *fixed* effects from the mixed model) reflected an individuals' risk of worse GHQ-12 in 2008 compared with 2007 according to *changes* in considered covariates from 2007 to 2008, having allowed for 'within' individual correlation of GHQ-12 scores across the two Waves (Table 2).

In Analysis 4, as with the pairwise testing, associations between worse psychological wellbeing and *all* considered variables were further investigated as the financial crisis unfolded, with all data being stratified by date and month as described in Analysis 2 (Table 3).

All analyses were conducted using GLLAMM version 2.3.15 (Rabe-Hesketh et al., 2005), within the statistical software package STATA 11.2 (StataCorp, 2009).

3. Results

Table 1a shows frequencies and total percentages (N = 11,743) of all considered explanatory variables, stratified by baseline psychological wellbeing (2007).

Table 1b compares the levels of generalised trust and social participation from the *same* respondents in 2007 and 2008 (N = 11,743), and showed a *decrease* in generalised trust from 40% in 2007 to 32% in 2008. Conversely, there was an *increase* in participation, from 43.6% in 2007 to 52.4% in 2008.

Table 1c presents pairwise odds ratios (OR) with 95% confidence intervals (95%CI) for trust and participation over time. Interpretation of the year-on-year comparison *(i)* (OR = 1.96, (95%CI) 1.81–2.11) implies that for each individual (N = 11,743), the odds for not trusting was 1.96 times higher in 2008 than in 2007, i.e. reduced trust levels seen in 2008 compared to 2007 (Table 1b) are statistically significant and not due to chance. Conversely, the odds for no participation in 2008 are 0.70 lower in 2008 than in 2007.

These patterns appear consistent when the same data were stratified by crisis timeframe cut-offs (Table 1c (ii)), with the greatest risk of not trusting occurring during the two weeks immediately after the global collapse of Lehman Brothers (OR = 2.20, (95%CI) 1.90–2.56).

The likelihood of not trusting in 2008 (compared to 2007) extends across all timeframes from 1st September through to 30th

Table 1c
Pairwise odds ratios (ORs) with 95% confidence intervals (95% CI) describing the likelihood of the same individuals having reduced social capital (as measured by trust and participation) in 2008 compared to 2007, derived from multilevel, longitudinal analysis: i) full year-on-year comparison; ii) stratified by crisis timeframe cut-offs (N = 11,743).

	Social capital	
i) Year-on-year comparison (N_T = 11,743)	Trusts others	1.0
	Cannot trust in 2008	1.96 (1.81–2.11)***
	Participates	1.0
	No participation	0.70 (0.66–0.74)***
ii) Timeframe (cut-offs)		
September 1st–14th (N_T = 2320)	Trusts others	1.0
	Cannot trust in 2008	1.96 (1.66–2.31)***
	Participates	1.0
	No participation	0.80 (0.71–0.90)***
September 15th–30th (N_T = 3434)	Trusts others	1.0
	Cannot trust in 2008	2.20 (1.90–2.56)***
	Participates	1.0
	No participation	0.67 (0.61–0.71)***
October 1st–31st (N_T = 3776)	Trusts others	1.0
	Cannot trust in 2008	1.82 (1.59–2.08)***
	Participates	1.0
	No participation	0.67 (0.61–0.74)***
November 1st–30th (N_T = 1580)	Trusts others	1.0
	Cannot trust in 2008	1.92 (1.56–2.36)***
	Participates	1.0
	No participation	0.65 (0.56–0.76)***
December 1st - April 30th (N_T = 633)	Trusts others	1.0
	Cannot trust in 2008	1.74 (1.25–2.41)***
	Participates	1.0
	No participation	0.77 (0.61–0.96)**

Reference group = 1.0.
*p < 0.05.
**p < 0.01.
***p < 0.001.
Source: BHPS, Waves 17 & 18.

April 2009. Similar patterns for participation are also seen in date-stratified data, with the odds for no participation being *least* in November 2008 (OR = 0.65, (95%CI) 0.56–0.76).

Table 2 presents the risk of having poor psychological wellbeing in 2008 after adjusting for changes in *all* considered covariates from 2007 to 2008. Individuals with low levels of trust in 2008 had an increased risk of worse psychological wellbeing in 2008 compared to 2007 (OR = 1.49, (95%CI) 1.34–1.65), even after considering individual perceptions of financial strain. Women (OR = 1.69, (95%CI) 1.51–1.89), those not married (OR = 1.41, (95%CI) 1.34–1.65), those with poor SRH (OR = 4.88, (95%CI) 4.38–5.43), the unemployed (OR = 1.98, (95%CI) 1.71–2.30) and those whose financial situation was perceived as 'now worse off' (OR = 2.23, (95%CI) 2.01–2.48) all had an increased risk of worse psychological wellbeing in 2008.

Covariates that protected against worse psychological wellbeing in 2008 compared with 2007 included being 'better off' financially and those with lower levels of education (Year 11 or no qualifications). Every ten-year increase in age also protected against worse psychological wellbeing. There was no significant association between psychological wellbeing and active participation.

Table 3(ii) presents associations between poor psychological wellbeing in 2008 and social capital only, still having adjusted for changes in *all* considered covariates (2007–08) but now stratified by crisis timeframe cut-offs. The association between worse GHQ-12 and lack of participation consistently lacks statistical significance; conversely, those who cannot trust maintained their increased risk for worse psychological wellbeing from 1st September until 30th November 2008.

4. Discussion

The aim of this longitudinal UK panel study was to investigate changes in social capital levels (generalised trust and social participation) across the UK and quantify its buffering effects on worse psychological wellbeing against the backdrop of the 2008 global financial crisis. Results revealed that there was a large, significant drop in generalised trust levels (from 40% to 32%) across the UK in 2008 compared to 2007. Conversely, social participation seemed to increase in 2008. However, care must be taken when drawing inference from this social capital proxy, as the question posed to determine participation rates differed between the two Waves (see appendix). Regarding any buffering effects of social capital, a lack of trust coincided with a greater overall negative effect on psychological wellbeing during and immediately after the 2008 crisis. After stratification by month (see Table 3(ii)), the negative effect of the crisis on psychological wellbeing extended up to December 2008 for those individuals who could not trust, with the greatest risk for worse GHQ-12 scores occurring immediately after the global collapse of Lehman Brothers (OR = 1.73, (95%CI) (1.42–2.12). No significant association between participation and GHQ-12 scores was observed.

This study further adds to the existing body of longitudinal social capital and mental health research by allowing pre- and post-crisis comparisons of the *same individuals* across the UK. By treating the crisis as a natural experiment of sorts, we were able to investigate the buffering role of social capital across consecutive, yet starkly contrasting years. Our results mirror other longitudinal research to demonstrate the protective effects of social capital against poor mental health outcomes (Bertotti et al., 2013; Ding et al., 2015; Frank et al., 2014; Giordano and Lindström, 2011; Hall et al., 2014; Han, 2015; Murayama et al., 2013; Tsuboya et al., 2015; Verduin et al., 2014). However, our results are in contrast to those of Economou et al. (2014), who concluded that the buffer provided by social capital on psychological wellbeing was fully attenuated by the effects of financial strain. In our study, lack of trust remained strongly associated with worse psychological

Table 2
Odd ratios (ORs) with 95% confidence intervals (95% CI) of the same individuals having worse psychological health in 2008 compared to 2007 according to multilevel, longitudinal analysis of all considered explanatory variables and potential confounders ($N_t = 11,743$).

Explanatory variables		Worse psychological wellbeing in 2008 (N = 11,743)
		ORs (95% CI)
Time		0.91 (0.83–0.99)*
Age	Per 10 year increase	0.91 (0.86–0.96)***
Gender	Male	1.0
	Female	1.69 (1.51–1.89)***
(Log) Household income - size weighted	Continuous	1.04 (0.97–1.13)
Social class: derived from most recent occupation-based RGSC schema	I	1.0
	II	1.01 (0.77–1.33)
	IIIa	0.97 (0.73–1.30)
	IIIb	0.78 (0.59–1.06)
	IV	0.79 (0.58–1.07)
	V	0.83 (0.57–1.19)
	Never worked	0.83 (0.61–1.12)
Generalised trust	Trusts others	1.0
	Cannot trust	1.49 (1.34–1.65)***
Social participation	Active participation	1.0
	No participation	1.03 (0.94–1.13)
Marital status	Married	1.0
	Not married	1.41 (1.26–1.58)***
Self-rated health	Good health	1.0
	Poor health	4.88 (4.38–5.43)***
Education	Undergraduate +	1.0
	Year 13	0.86 (0.73–1.02)
	Year 11	0.73 (0.63–0.86)***
	No Qualifications	0.77 (0.65–0.93)**
Employment status	Employed	1.0
	Unemployed	1.98 (1.71–2.30)***
	Retired	1.13 (0.93–1.38)
	FT student	1.09 (0.85–1.38)
Financial situation	Still the same	1.0
	Now better off	0.85 (0.75–0.96)*
	Now worse off	2.23 (2.01–2.48)***

Reference group = 1.0.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.
Source: BHPS, Waves 17 & 18.

wellbeing, even after considering individuals' perceptions of financial strain (Tables 2 and 3). However, it is important to note that this study investigated associations during and immediately after the onset of the 2008 crisis in the UK; the study by Economou et al. (2014) was conducted in Greece after several years of harsh Governmental austerity.

There were no effects on psychological wellbeing from the social capital proxy 'active social participation' in this study. However, as the question employed to determine participation differed somewhat between 2007 and 2008 (see appendix), we remained cautious in drawing inferences.

Year-on-year comparisons of social capital levels also provided insight into the possible impact of the financial crisis on UK stocks of social capital (Tables 1b & 1c). Pre- and post-crisis analyses revealed a substantial and statistically significant decrease in generalised trust across the UK, from 40% in 2007 to 32% in 2008 (Tables 1b & 1c). As data for each Wave were collected from September onwards (and considering the timeframe of the 2008 crisis), such empirical evidence provides strong support for the theory offered by Pildes (1996), that this global event and/or the subsequent Governmental response could be responsible for the drop in levels of generalised trust. Conversely, there seemed to be a significant increase in participation levels from 2007 to 2008; however, as stated previously, the question employed to determine participation differed between 2007 and 2008, so we are unsure if the reported increase is an artefact.

As touched upon in the Introduction, fluctuations in trust revealed in these (and other) panel data add strength to the theory that generalised trust is indeed a summary measure of individual experiences. From all BHPS data Waves when trust was measured (years 1998, 2000, 2003 and 2005), analyses showed that trust levels were relatively stable across the UK, between 38 and 44%. One notable exception, however, was the year 2005. Trust levels decreased from 44% in 2003 to 33% in 2005, the year when the city of London was subjected to the July 7th terror attacks (British Broadcasting Corporation, 2005). The 25% drop in trust (in real terms) from BHPS data seen in 2005 adds weight to the economic viewpoint of fluctuating generalised trust levels, and further supports the plausibility that trust could also drop because of events surrounding the 2008 financial crisis. Of interest, other survey data (the World Values Survey) also reported similarly low levels of UK trust in 2005 (30% can trust, N = 1041); unfortunately, no 2008 data were available for the UK from this source for comparison (World Values Survey, 2005).

Associations between worse psychological wellbeing in 2008 (compared with 2007) and *changes* in all other considered variables from 2007 to 2008 were presented in Table 2. Notably, unemployed individuals had an increased risk of worse psychological wellbeing in 2008 (OR = 1.98, (95%CI) 1.71–2.30), which may reflect feelings of uncertainty for the future. Poor self-rated health was also associated with worse psychological wellbeing (OR = 4.88, (95%CI) 4.38–5.43). This was expected (Tessler and Mechanic, 1978) and lends further weight to our other results.

Unexpectedly, social class (as determined by most recent

Table 3
Odd ratios (ORs) with 95% confidence intervals (95% CI) of the same individuals having worse psychological health in 2008 compared to 2007 according to multilevel, longitudinal analysis of all considered explanatory variables and potential confounders [a] ($N_t = 11,743$) i) Full year, and ii) Crisis timeframe cut-offs. Note: only social capital results shown.

Date/month	Social capital	Worse psychological health in 2008
		ORs (95% CI)
i) Full year [a] (2008) ($N_T = 11,743$)	Trusts others	1.0
	Cannot trust	1.49 (1.34–1.65)***
	Active participation	1.0
	No participation	1.03 (0.94–1.13)
ii) Timeframe [a] (cut-offs)		
September 1st–14th (N = 2406)	Trusts others	1.0
	Cannot trust	1.40 (1.09–1.79)**
	Active participation	1.0
	No participation	1.03 (0.83–1.28)
September 15th–30th (N = 3384)	Trusts others	1.0
	Cannot trust	1.73 (1.42–2.12)***
	Active participation	1.0
	No participation	0.96 (0.81–1.14)
October 1st–31st (N = 3780)	Trusts others	1.0
	Cannot trust	1.46 (1.22–1.76)***
	Active participation	1.0
	No participation	0.96 (0.82–1.13)
November 1st–30th (N = 1549)	Trusts others	1.0
	Cannot trust	1.36 (1.06–1.75)**
	Active participation	1.0
	No participation	1.17 (0.93–1.48)
December 1st - April 30th (N = 624)	Trusts others	1.0
	Cannot trust	1.19 (0.78–1.81)
	Active participation	1.0
	No participation	1.38 (0.94–2.03)

*p < 0.05.
**p < 0.01.
***p < 0.001.
Reference group = 1.0.
[a] Model adjusted for Gender, Age, Marital status, Social class, Employment status, Highest achieved education, Self-rated health, Financial situation and Household income.
Source: BHPS Waves 17 and 18.

employment) showed no significant association with worse psychological wellbeing (Marmot et al., 1997). This could be a product of the inclusion of other well-known mental health variables, such as gender and employment status. As Wave 18 (year 2008–9) was the last Wave of the BHPS, it was not possible to investigate if patterns of association with social class changed over subsequent years, post-crisis. Future research may consider investigating the longer-term effects of austerity on psychological wellbeing within the different social class groups in the UK. Furthermore, the successor to the BHPS, 'Understanding society' which rolled out in 2010, no longer asked respondents about generalised trust attitudes. It is, therefore, not possible to investigate the longer-term buffering effects of trust on psychological wellbeing in the UK from these data sources.

Interestingly, low/no qualifications seemed to protect against worse psychological wellbeing in 2008 (Table 2). As the timeframe of this study was just two years, this result could represent those who remained within the school system during the timeframe of this study. However, cross-tabulations revealed that this assumption is unlikely, as the 16–24 year old age groups represented just 12.2% of those with Year 11 or less qualifications, compared with those aged 25 years or older in 2008 (87.8% - results not published). That lower levels of education protected individuals against worse psychological wellbeing may rather reflect perceptions regarding the short-term ramifications that the financial crisis may have on this specific subgroup (Malhotra and Margalit, 2010).

5. Strengths and weaknesses

A major strength of this panel study is that it is longitudinal, comparing the *same individuals* pre- and post-crisis, with a high number of individual respondents ($N = 11,743$). That these panel data span the advent of the 2008 financial crisis allowed us to consider this event as a natural experiment of sorts and to draw inference from any changes in associations over the timeframe of this study. This is, however, not a typical example of a natural experiment, as there is no similar 'control group' to compare against in our study population. To our knowledge, this is the first longitudinal research paper to investigate the buffering effects of social capital on psychological wellbeing against the backdrop of this historic event. The data were obtained via interview rather than relying on postal questionnaires, which contributed to the very high participation rate of around 95%, year on year (Taylor et al., 2010). Although there are more complex GHQ instruments (28- or 60-item) to measure psychological wellbeing, there seems little difference in validity between these and the GHQ-12 item used in this study (Goldberg et al., 1997). Unfortunately, there is no 'gold standard' with which to validate generalised trust; however, it has been considered an acceptable proxy of social capital for two decades (Islam et al., 2006; Putnam, 2001). To reduce the risk of potential confounding, we further included numerous well-known mental health determinants in our full model analyses.

One major limitation is that the BHPS sample was originally selected to reflect the UK population as a whole, so deliberately avoided oversampling of smaller-sized communities. Values obtained for GHQ-12, SRH and perceived financial strain were relative, i.e. responses given were dependent on respondents' usual levels (of GHQ-12, SRH, financial situation); as such, some self-report bias may have been introduced, though the validity of our outcome measure (GHQ-12) is high (see Methods). By year 2007, only 44.5%

of the original (1991) cohort members were able to answer the questions posed (Taylor et al., 2010). This would have introduced further selection bias into this study. As the BHPS was in its final year in 2008, we were only able to investigate the shorter-term effects of the financial crisis on social capital and psychological wellbeing. Another limitation is that there were differences in the question regarding active participation in years 2007 and 2008 (see appendix). Care, therefore, must be taken when interpreting the effects of this social capital proxy. Marital status was reduced to the dichotomous 'married' and 'not married' (separated, divorced, widowed, never married). Though this method of reduction has been previously validated (Afifi et al., 2006), it may hide more complex pathways regarding cohabitation common in society today.

6. Conclusion

The longitudinal, multilevel design of this study allowed for the comparison of the *same individuals* over time, whilst treating the 2008 financial crisis as a natural experiment of sorts. From this, we can report two major findings from this study: i) the crisis itself coincided with a significant drop in generalised trust levels across the UK, from 40% in 2007 to 32% in 2008 and, ii) despite this reduction, the buffering effects of trust remained fully evident, with those not trusting being at risk of worse psychological wellbeing in 2008 compared to the previous year (OR = 1.49, (95%CI) 1.34–1.65). From this, we can conclude that social capital (generalised trust) seems a relatively changeable resource, whose levels are susceptible to individuals' current perceptions and experiences. Despite its apparent volatility, however, those individuals who managed to retain trust during times of uncertainty were protected against worsening psychological wellbeing during the 2008 financial crisis. Decision makers should be made aware of how events such as the crisis (and the measures taken to counter its effects) could negatively impact on a Nation's levels of trust. The positive (short-term) effects of trust on psychological wellbeing evident in this study implies that decision makers should also make it a priority to ensure that social capital stocks can be restored to pre-crisis levels; as Economou et al. (2014) imply, reserves of social capital and its positive effects on psychological wellbeing may become fully attenuated if allowed to dwindle over years of austerity and financial strain.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.socscimed.2016.02.008.

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